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(54) **Warp mending device**

Kettfädenreparierеinrichtung

Dispositif pour la réparation des fils de chaîne

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EP-A- 0 259 915
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EP-A- 0 364 404
EP-A- 0 381 143
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Description

The present invention relates to a warp mending device capable of feeding a mending yarn from a bobbin to drop wires and a heddle respectively positioned at the portion where one of the warps is broken in the weaving operation so that a loom can be restarted.

Document EP-A-0 259 915 discloses mechanical and pneumatic warp repair threading means, comprising a movable mechanical and pneumatic module which inserts one end of a replacement thread through a drop wire, and moves in the warp longitudinal direction to insert the other end through the corresponding heddle.

Document EP-A-0 364 404 discloses warp repair means comprising rolled up steel belt means for threading a replacement yarn first through a drop wire and then to transfer means transferring the yarn to another belt means, which passes the yarn through a heddle.

It is necessary to draw the mending yarn into a mail of the heddle corresponding to the broken warp at the time of mending the broken warp. In the drawing operation, a heddle frame corresponding to the broken warp need to be specified while it is necessarry that the drawing means need be relatively positioned relative to the mail of the heddle supported by the heddle frame.

Such positioning of the drawing means relative to the mails of heddles is conventionally effected by stopping the heddle frame at a predetermined shed position and operating the drawing means for the interval of moving range so that the drawing means and the mails of the heddles are relatively positioned.

Inasmuch as the stopping position of the heddle frame produces an error and the stopping positions between a plurality of heddle frames are differentiated due to the shed size, thereby deteriorating the positioning precision. Furthermore, when the warp line or the shed size is varied, the moving range of the drawing means need be varied which renders the operation complicate. Still furthermore, when the warp line or the shed size is differenciated for each loom, there is a likelihood that the vertical positioning is not effected precisely within a predetermined moving range so that the drawing means cannot be served or used for a plurality of looms.

Accordingly, it is the object of the present invention to enable a warp mending device to mend a broken warp irrespective of a breakage position of the broken warp.

To achieve the first object of the present invention, the warp mending device with the features of claim 1 is provided. Further features of the invention are set out in Claims 2-3.

When the warp is broken, the yarn leading device draws the mending yarn unwound from the bobbin into, e.g. the slot of the drop wire positioned at the upper stream and leads the mending yarn to the inlet of the yarn guide line. At this state, the nozzle can draw the mending yarn from the yarn guide line to the mail of the heddle by generation of air current in the yarn guide line in the drawing direction. At this time, inasmuch as the positioning device has previously positioned the heddle relative to the outlet of the guide line, the mending yarn is drawn into the mail of the heddle from the outlet of the yarn guide line. In such a manner, the mending yarn can be drawn into the slot of the drop wire and the mail of the heddle so that the loom can be restarted.

According to the yarn mending device set forth above, the mending yarn is drawn afresh into the drop wire and the heddle and thereafter the mending yarn is connected to the broken warp at the let-off side so that the broken warp can be mended even if one of the warps is broken at the portion adjacent to the drop wires or the heddles. That is, the warp mending device can perform its function irrespective of the breakage position of the broken warp. Furthermore, since the mending yan can be drawn into the slot of the drop wire and the mail of the heddle by air current, the mending operation of the broken warp can be expedited accordingly.

Still furthermore, the yarn guide is intervened between the drop wires and the heddle and the mending yarn can be fed with certainty so that the yarn can be guided without interferring with other members. In addition to that, the positioning device can position the yarn guide line relative to the mail of the heddle so that the drawing operation can be made with certainly without utilizing special drawing means such as a needle.

Fig. 1 is a side elevational view of a warp mending device according to a first embodiment of the present invention;
Fig. 2 is an enlarded side view of a yarn guide of the warp mending device of Fig. 1;
Fig. 3 is an enlarded front view of a yarn guide of the warp mending device of Fig. 1;
Fig. 4 is a view showng a state where drop wires of the warp mending device of Fig. 1 are twisted;
Fig. 5 is a side view of a yarn leading device of the warp mending device of Fig. 1;
Fig. 6 is a front view of a yarn leading device of the warp mending device of Fig. 1;

The warp mending device according to an embodiment of the present invention will be described hereinafter.

A plurality of warps 1 arranged in a sheet is drawn into drop wires 4 of a warp stop motion 3 through a let-off roller 2 at the let-off side and further drawn into mails of heddles 6 supported by heddle frames while a shed 7 is defined and interlaced with a weft 99 in front of a cloth fell 8 and woven as a fabric 9.

A yarn mending device 10 of the present invention comprises a yarn guide 11, a nozzle 12, a yarn leading device 13 and a positioning device 14.

The yarn guide 11 can be moved between the drop wires 4 and the heddle frames 5 corresponding to a trailing edge 1a and a leading edge 1b with slightly inclined state in the width direction of a loom, in the direction of the warps 1 and in the vertical direction. The yarn guide

11 defines a cut-off part 16 communicating with the exterior along the longitudinal direction of a yarn guide channel 15 in the drawing direction and also defines a splitting guide 17 at the lower end thereof, if need be.

The splitting guide 17 becomes gradually thinner toward the lower end portion thereof and is inclined vertically along the direction of the warps at the tip end thereof. According to the first embodiment, the yarn guide channel 15 has an inlet opened large at the end surface thereof the amount of opening is narrowed toward an outlet of the yarn guide channel 15.

According to the first embodiment, a drawing nozzle 18 of the yarn leading device 13 and a guide nozzle 19 are provided along the yarn guide channel 15 in which the air current in the drawing direction is generated within the yarn guide channel 15.

The yarn leading device 13 draws a 22 from a bobbin 21 into a slot 20 of the drop wire 4 from the let-off side and leads the mending yarn 22 toward the inlet of the yarn guide channel 15 and comprises the nozzle 18 and feeding means 23.

The nozzle 18 is, as illustrated in Fig. 1, Fig. 5 and Fig. 6, attached to a nozzle holder 36 together with the bobbin 21 with appropriate inclination in which the nozzle holder 36 can be moved by an air cylinder 41 along the groove of a guide frame 37 in the direction of the warps 1 and is restricted at the fowarding end by a plurality of stoppers 38 corresponding to the number of rows of drop wires. The stopper 38, each driven by each of a solenoid 39 upon reception of row data of drop wires, protrudes inside the guide frame 37, thereby restricting the moving range of the nozzle holder 36. The guide frame 37 can be moved vertically by a vertical air cylinder 40 attached to a table 35 while it is held horizontal.

The positioning device 14 is provided for positioning the mail 24 of the heddle 6 relative to the outlet of the yarn guide line 15 and comprises, according to the first embodiment, a positioning member of the yarn guide 11 and a known levelling means 25 relative to each of the heddle frames 5.

When one of the warps 1 is broken during the weaving operation, the drop wire 4 corresponding to the broken warp 1 is dropped so that a warp stop signal is issued from the warp stom motion 3 to a control unit of the loom, hence the loom is automatically stopped at a predetermined angular interval. At this time, warp stop signal is generated at a contact lever 26 corresponding to the dropped drop wire 4 and supplied to a control unit 30 as the row data of the drop wires. The control unit 30 includes therein programs necessary for execution of sequential warp mending operations and executes controls of each element in the following manner.

The control unit 30 turns twisting bars 27 all at once in the width direction of the loom clockwise at 90° as illustrated in Fig. 4. The two twisting bars 27 have respectively projection pieces 27a extending in the width direction of the loom and clamp the dropped drop wires 4 between the projection piece 27a and the adjacent twisting bar 27 while the lower ends thereof are turned substantially at 90° around vertical axes thereof. As a result, the slots 20 of the drop wires 4 are opposed to the drawing 18 at the wide areas.

Thereafter, a sensor holder 28 is moved from the standby position of the end of a selvage toward the width direction of the loom so that the dropped drop wires 4 can be detected at the lower portion of a pair of photosensor 29 and issues a yarn breakage position signal corresponding to the width direction of the dropped drop wires 4 to the control unit 30.

Subsequently, the dropped drop wire 4 is raised at the same height as the normal drop wires 4, if need be. The raising operation can be accomplished by raising a plate 31 rotatably supporting the twisting bar 27 at the both ends thereof to the lower ends of other normal drop wirers 4 together with the twisting bar 27. The turn and raise of the dropped drop wires 4 can be made by a gripper as disclosed in Japanese Laid-Open Publication No. 63-28951 in which the gripper is raised and turned while holding the dropped drop wire 4.

Thereafter, since there is a possibility that both the trailing edge 1a and leading edge 1b are drawn into the slot of the drop wire 4 and the mail of the heddle 6, the control unit 30 starts the operation to remove both the trailing edge 1a and leading edge 1b from the slot of the drop wire 4 and the mail of the heddle 6.

The removing operation can be made automatically using a removing device 91. The removing device 91 comprises a suction pipe 89 composed of a pair of winding rollers 93 and 94 and a gripper 95 and a cutter 97. The suction pipe 89 is operated by a driving unit, not shown, to move in the width direction of the loom over the portion adjacent to the let-off side of the warp stop motion 3. When the trailing edge 1a is removed from the drop wire 4, the suction pipe 89 is first moved toward the drop wire 4 corresponding to the trailing and leading edges 1a and 1b. The movement of the suction pipe 89 toward the drop wire 4 is first made on the basis of the signal issued by a pair of photosensors 29. Then, the suction pipe 89 is lowered by an air cylinder 85 while the suction pipe 89 carries out the suction operation. Thereafter, the trailing edge 1a is displaced in U-shape while it is guided into slits 90 of the suction pipe 89 owing to the suction operation of the suction pipe 89. If a sensor 86 detects that the trailing edge 1a is displaced for a predetermined amount, the gripper 95 grips the trailing edge 1a at the feeding side rather than the side of the suction pipe 89 and the trailing edge 1a is cut by a cutter 97 between the gripper 95 and the suction pipe 89.

Successively, one winding roller 94 is advanced to another winding roller 93 while the winding roller 93 is rotated by a motor 96 so that the trailing edge 1a at the winding side is removed. When the sensor 86 detects that the trailing edge 1a drawn into the drop wire 4 is removed, the suction pipe 89 is stoped to operate. The suction pipe 89 delivers the trailing edge 1a at the feed-

ing side to a knotter, not shown, so that the trailing edge 1a can be connected with the mending yarn, and returns to its original position or moves to a predetermined standby positon while it grips the trailing edge 1a.

A removing device for removing the leading edge 1b drawn into the heddle 6 has same construction as the removing device 91 except that the gripper 95 and the cutter 97 are provided in the reverse relation relative to those of the removing device 91. The removing device at the side of the heddle 6 is provided to be movable between a reed 58 and the cloth fell 8. After the leading edge 1b is removed, the leading edge 1b at the side of the take-up side is kept in the suction state until the loom is restared or positioned to the portion where it does not hinder the loom from being restarted.

The winding rollers 93 and 94 are not always necessary to be provided if both the trailing edge 1a and leading edge 1b can be removed by the suction forth alone.

Upon completion of the removal of both the trailing edge 1a and leading edge 1b from the drop wire 4 and the heddle 6, numbers of the heddle frames 5 corresponding to both the trailing edge 1a and leading edge 1b are detected. The numbers of the heddle frames 5 are directly detected by a heddle number detector as disclosed in Japanese Patent Laid-Open Publication No. 1-24673. There is disclosed a device in Japanese Patent Laid-Open Publication No. 1-174649 which device discriminates a code of the dropped drop wire 4, while all the drop wires 4 are previously coded corresponding to the numbers of the heddle frame 5 in the order of drawing the warps 1, and indirectly detects the number of heddle frames on the basis of one of codes given to the dropped drop wires 4. Alternatively, the numbers of the heddle frames 5 is detected by reading the frame numbers corresponding to both the trailing edge 1a and leading edge 1b by a warp breakage signal issued by the heddle frame 5 supporting the dropped heddle 6 when the warp is broken as disclosed in Japanese Patent Laid-Open Publication No. 46-39150 in which the heddle 6 supported by the heddle frame 5 incorporates therein a warp breakage detector.

The control unit 30 rotates, upon reception of the yarn breakage position signal issued by a pair of photosensors 29, a feeding motor 32 of the feeding means 23 for a predetermined amount of revolution, thereby driving a feeding screw unit 33 and move the table 35 along a rail 34 disposed in the width direction of the loom so that the slot of the drop wire 4 is positioned at the line extending from the central line of the drawing nozzle 18.

The yarn leading device 13 receives a control command from the control unit 30 and drives the the vertical air cylinder 40 vertically so that the tip end of the drawing nozzle 18 is moved to the height of the slot 20 of the drop wire 4 while the nozzle holder 36 is moved toward the drop wires 4 by the air cylinder 41. The moving range at this time is restricted by the stopper 38 corresponding to the rows of the drop wires 4. Accordingly, after the movement of the tip end of the drawing nozzle 18 and the nozzle holder 36, the tip end of the drawing nozzle 18 is directed to approach the slot 20 of the drop wire 4 coresponding to the trailing edge 1a and leading edge 1b.

The positioning device 14 moves, upon reception of the command issued by the control unit 30, the yarn guide 11 as the drawing means from the standby position to the width direction of the loom so that the yarn guide 11 can be positioned at a predetermined hight. That is, the control unit 30 first controls the revolution of the feeding motor 42 on the basis of yarn breakage signal, thereby driving a feeding belt driving pulley 43 so that a frame 44 having wheels is moved along a rail 45 toward the width direction of the loom. The control unit 30 further rotates a raising motor 46 having a stop mechanism therein whereby a rack 48 meshing with a pinion 47 by rotation of the raising motor 46 is moved downward, thereby lowering a stay 49 and a guide frame 50 along a guide bar 57 so that a holder 51 serving also as a slider movable in the direction of warp 1 relative to the guide frame 50 and the yarn guide 11 supported by the holder 51. The relative positioning between the warp 1 and the heddle 6 is effected by lowering the guide yarn until the lower surface of the guide frame 50 forming the reference portion of the drawing means contacts the upper surface of the heddle frame 5 corresponding to both the trailing edge 1a and leading edge 1b which are previously moved to the portion higher than the other heddle frames 5 by the operation of the levelling means 25 in a predetemined amount.

During the yarn guide 11 is lowered, the lower end of the splitting guide 17 enters the warp 1 adjacent to the trailing edge 1a and leading edge 1b and splits the warps 1 at both sides thereof so that the yarn guide 11 can enters the plurality of normal warps 1 adjacent to both the trailing edge 1a and leading edge 1b with ease. At the state where the lower surface of the guide frame 50 is brought into contact with the upper surface of the heddle frame 5, the hights of the inlet and the outlet of the yarn guide line 15 respectively conform to the hights of the slot 20 of the drop wire 4 and the mail 24 of the heddle 6. Furthermore, the positioning device 14, upon reception of the command from the 30, rotates a motor feeding means 23 in a predetermined amount of revolution on the basis of the number of the heddle frame 5 corresponding to both the trailing edge 1a and leading edge 1b so that the exit of the yarn guide line 15 is advanced toward the mail 24 of the heddle 6 by way of the guide frame 50.

The outlet of the yarn guide 11 is provided with a magnet 52 and a V-shaped heddle guide so as to attract the heddle 6 thereto so that the mail 24 of the heddle 6 conforms to the outlet of the yarn guide channel 15 with certainty. Inasmuch as the inlet opening of the yarn guide line 15 is defined in large, even if the hight of the wap line is slightly varied depending on the loom, there is no likelihood that the height of the inlet of the yarn

guide line 15 does not conform to that of the slot 20 of the drop wire 4.

Thereafter, the mending yarn 22 unwound around the bobbin 21 is inserted inside the drawing nozzle 18 and drawn into the slot 20 of the drop wire 4 corresponding to both the trailing edge 1a and leading edge 1b together with the jetted fluid, and then fed into the yarn guide line 15 of the yarn guide 11 and drawn into the mail 24 of the heddle 6. During this period, the drawing nozzle 18 and the guide nozzle 19 cooperate with each other for generating air current along the yarn guide line 15 in the drawing direction and successively unwond the mending yarn 22 from the bobbin 21.

The mending yarn 22 reached the heddle 6 is confirmed by a yarn signal issued by a yarn sensor 54. Accordingly, after the confirmation, the drawing nozzle 18 and the guide nozzle 19 are automatically stopped to jet the fluid under pressure while a pair of clampers 55 provided between the bobbin 21 and the inlet of the drawing nozzle 18 clamp the mending yarn 22 by the force generated between a solenoid 53 and a spring 59 and retains the mending yarn 22 for the moment. If the presence of the drawing nozzle 18 is not detected by the yarn sensor 54 within a predetermined time, the control unit 30 issues an alarm which is notified outside by means of sound or light.

Thereafter, the clampler 55 releases the mending yarn 22 by the operation of the solenoid 53 so that air cylinder 41 moves the drawing nozzle 18 backward, i.e. move leftward in Fig. 1 and the mending yarn 22 is guided to the knotter, now shown, provided at the rear portion of the drop wires 4. Accompanyed by the movement of the drawing nozzle 18, the mending yarn 22 is unwound from the bobbin 21. If the mending yarn 22 is clamped by the clamper, not shown at the outlet of the yarn guide channel 15 when the drawing nozzle 18 is retracted, the mending yarn 22 can be unwound from the bobbin 21 with certainty. After the mending yarn 22 is connected to the trailing edge 1a, the connected trailing edge 1a and the mending yarn 22 are cut by a cutter 56 movable forward by the actuation of a solenoid 121. The knotter is provided between the drop wires 4 and the let-off roller 2 and movable in the width direction of the loom together with the drawing nozzle 18. As shown in Fig. 1, the drawing nozzle 18 is illustrated to move backward at maximum at the portion adjacent to the let-off side of the warp stom motion 3, but it is practically movable toward the let-off roller 2 so that the mending yarn 22 can be guided by the knotter.

The knotter connects the trailing edge 1a to one of the mending yarn 22 by connecting the trailing edge 1a at the beam side guided manually or by the remvoing device 91. The mending yarn 22 drawn into the mail of the heddle 6 is, transferred to a reed drawing device, not shown, and drawn into the dents of a reed manually or by the reed drawing device.

Thereafter, each of the components of the yarn mending device 10 completes the warp mending operation and returns to the original position so as to be kept ready for next mending operation. During the raising operaton of the yarn guide 11, the mending yarn 22 is not influenced by raising operation since the mending yarn 22 inside the yarn guide channel 15 passes the cut-off part 16 and is slips out of the yarn guide 11. At this state, the loom is kept ready for restarting.

The connection of the trailing edge 1a and the mending yarn 22 may be made by the operator without resorting to the knotter. In this case, the time for involving in the connection operation can be reduced since the mending yarn 22 is drawn into the slot of the drop wire 4 or the mail of the heddle 6.

Claims

1. A warp mending device (10) in which a mending yarn (22) is drawn into a mail (24) of a heddle (6) corresponding to a leading edge (1b) of a broken warp (1) from a slot (20) of a drop wire (4) corresponding to a trailing edge (1a) of the broken warp (1), in that the device additionally comprises:

   a yarn guide (11) having a yarn guide channel (15) which extends along the entire longitudinal direction thereof;

   nozzle means (19) for generating an air current within the yarn guide channel (15) of the yarn guide (11) in the direction from the slot (20) of the drop wire (4) to the mail (24) of the heddle (6) when the mending yarn (22) is drawn;

   a mending yarn supply device (13) for drawing the mending yarn (22) from a bobbin (21) into the slot (20) of the fallen drop wire (4), and guiding the thus drawn mending yarn (22) into an inlet of the yarn guide channel (15); and

   a positioning device (14) for moving the yarn guide (11) and for positioning an inlet and outlet of the yarn guide channel (15) of the yarn guide (11) to positions confronting the slot (20) of the drop wire (4) and the mail (24) of the heddle (6) corresponding the broken warp (1) when the warp is broken,

   such that the yarn guide (11) has a yarn guide channel (15) which is positioned between the slot (20) of the drop wire (4) and the mail (24) of the heddle (6) when the mending yarn (22) is drawn, said channel (15) having an opening (16) along its entire length for allowing the release of the mending yarn (22) after it has passed through the yarn guide channel (15).

2. A warp mending device (10) according to Claim 1,

wherein the opening (16) of the yarn guide channel (15) of the yarn guide (11) is always opened and the nozzle means (19) consists of a plurality of guide nozzles (19) provided along the yarn guide channel (15).

3. A warp mending device (10) according to Claim 1, wherein the yarn guide channel (15) of the yarn guide (11) has the opening (16) which is closed when the mending yarn (22) is being drawn and is opened after said drawing of the mending yarn (22), and wherein a drawing nozzle (18) of the mending yarn supply device (13) is provided for drawing the mending yarn (22) to the inlet of the yarn guide channel (15).

Patentansprüche

1. Eine Vorrichtung (10) zum Ausbessern eines Kettfadens, bei dem der Kettfaden (22) in eine Bewehrung einer Litze (6) entsprechend einem führenden Stück (1b) eines gebrochenen Kettfadens (1) von einem Schlitz (20) eines Abfalldrahtes entsprechend dem nachlaufenden Stück (1a) des gebrochenen Kettfadens (1) gezogen wird, bei der die Vorrichtung zusätzlich aufweist:

   eine Fadenführung (11) mit einem Fadenführungskanal (15), der sich entlang deren gesamter Längsrichtung erstreckt;

   Düsenmittel (19) zum Erzeugen eines Luftstroms in dem Fadenführungskanal (15) der Fadenführung (11) in der Richtung von dem Schlitz (20) des Abfalldrahts (4) zu der Bewehrung (24) der Litzen (6), wenn der Ausbesserungsfaden (22) gezogen wird;

   eine Vorrichtung (13) zum Zuführen eines Ausbesserungsfadens zum Abziehen eines Ausbesserungsfadens (22) von einer Spule (21) in den Schlitz (20) des abgefallenen Abfalldrahtes (4) und Führen des so abgezogenen Ausbesserungsfaden (22) in den Einlaß des Fadenführungskanals (15); und

   eine Positionierungsvorrichtung (14) zum Bewegen der Fadenführung (11) und zum Positionieren eines Einlasses und eines Auslasses des Fadenführungskanals (15) der Fadenführung (11) in Positionen, die dem Schlitz (30) des Abfalldrahtes (4) und der Bewährung (24) der Litze (6) gegenüberliegen, entsprechend dem gebrochenen Kettfaden (1), wenn der Kettfaden gebrochen ist,

   derart, daß die Fadenführung (11) einen Fadenführungskanal (15) hat, der zwischen dem Schlitz (20) des Abfalldrahts (4) und der Bewehrung der Litze (6) positioniert ist, wenn der Ausbesserungsfaden (22) abgezogen ist, wobei der Kanal (15) eine Öffnung (16) entlang ihrer gesamten Länge hat, um die Freigabe des Ausbesserungsfadens (22) zu erlauben, nachdem dieser durch den Fadenführungskanal (15) gelaufen ist.

2. Eine Vorrichtung (10) zum Ausbessern eines Kettfadens nach Anspruch 1, wobei die Öffnung (16) des Fadenführungskanals (15) der Fadenführung (11) immer geöffnet ist und das Düsenmittel (19) aus einer Mehrzahl von Führungsdüsen (19) besteht, die entlang des Fadenführungskanals (15) angeordnet sind.

3. Eine Vorrichtung (10) zum Ausbessern eines Kettfadens nach Anspruch 1, wobei der Fadenführungskanal (15) der Fadenführung (11) eine Öffnung (16) hat, die geschlossen ist, wenn der Kettfaden (11) abgezogen wird und der nach dem Abziehen des Ausbesserungsfadens (22) geöffnet ist und wobei die Abziehdüse (18) der Vorrichtung (13) zum Zuführen der Ausbesserungsfadens vorgesehen ist, um den Ausbesserungsfaden (22) in den Einlaß des Fadenführungskanals (15) zu ziehen.

Revendications

1. Dispositif de réparation de fil de chaîne (10) dans lequel un fil de réparation (22) est tiré jusqu'à l'intérieur d'un oeillet (24) d'une lisse (6) correspondant à un bord de tête (1b) d'un fil de chaîne cassé (1) à partir d'une fente (20) d'une lame de fil de chaîne (4) correspondant à un bord de queue (1a) du fil de chaîne cassé (1), caractérisé en ce que le dispositif comporte de plus :

   un guide de fil (11) ayant un canal de guidage de fil (15) qui s'étend tout le long de la direction longitudinale de celui-ci ;
   des moyens formant buse (19) pour engendrer un courant d'air à l'intérieur du canal de guidage de fil (15) du guide de fil (11) dans la direction partant de la fente (20) de la lame de fil de chaîne (4) vers l'oeillet (24) de la lisse (6) lorsque le fil de réparation (22) est tiré ;
   un dispositif d'alimentation de fil de réparation (13) destiné à tirer le fil de réparation (22) à partir d'une bobine (21) jusqu'à l'intérieur de la fente (20) de la lame de fil de chaîne tombée (4) et guider le fil de réparation ainsi tiré (22) jusqu'à l'intérieur d'une entrée du canal de guidage de fil (15) ; et
   un dispositif de positionnement (14) pour dé-

placer le guide de fil (11) et pour positionner une entrée et une sortie du canal de guidage de fil (15) du guide de fil (11) vers des positions en vis-à-vis de la fente (20) de la lame de fil de chaîne (4) et de l'oeillet (24) de la lisse (6) correspondant au fil de chaîne cassé (1) lorsque le fil de chaîne est cassé,
De sorte que le guide de fil (11) a un canal de guidage de fil (15) qui est positionné entre la fente (20) de la lame de fil de chaîne (4) et l'oeillet (24) de la lisse (6) lorsque le fil de réparation (22) est tiré, ledit canal (15) ayant une ouverture (16) située tout le long de sa longueur pour permettre la libération du fil de réparation (22) après qu'il soit passé à travers le canal de guidage de fil (15).

2. Dispositif de réparation de fil de chaîne (10) selon la revendication 1, dans lequel l'ouverture (16) du canal de guidage de fil (15) du guide de fil (11) est toujours ouverte et les moyens formant buse (19) sont constitués de plusieurs buses de guidage (19) agencées le long du canal de guidage de fil (15).

3. Dispositif de réparation de fil de chaîne (10) selon la revendication 1, dans lequel le canal de guidage de fil (15) du guide de fil (11) a l'ouverture (16) qui est fermée lorsque le fil de réparation (22) est tiré et qui est ouverte après ladite traction du fil de réparation (22) et dans lequel une buse de traction (18) du dispositif d'alimentation de fil de réparation (13) est fournie pour tirer en fil de réparation (22) vers l'entrée du canal de guidage de fil (15).

FIG.1

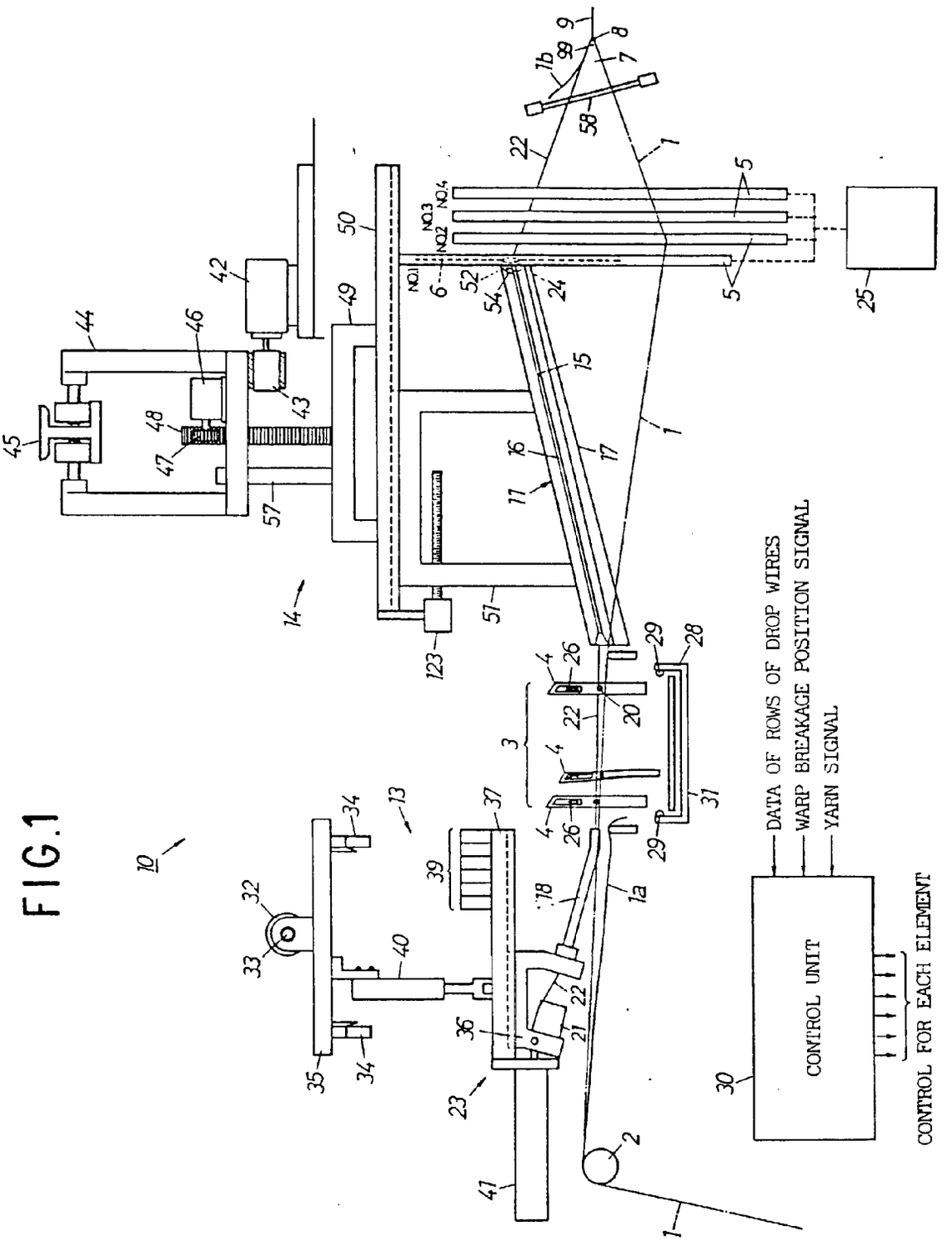
DATA OF ROWS OF DROP WIRES
WARP BREAKAGE POSITION SIGNAL
YARN SIGNAL
CONTROL UNIT
CONTROL FOR EACH ELEMENT

FIG.2

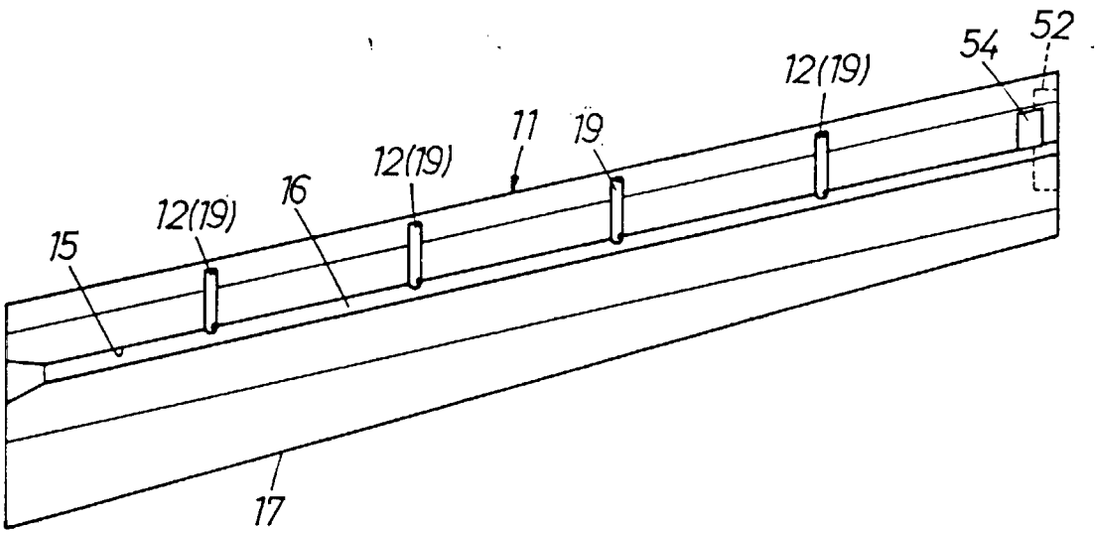

FIG.3

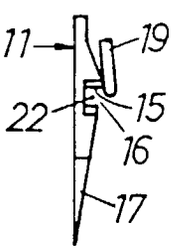

FIG.4

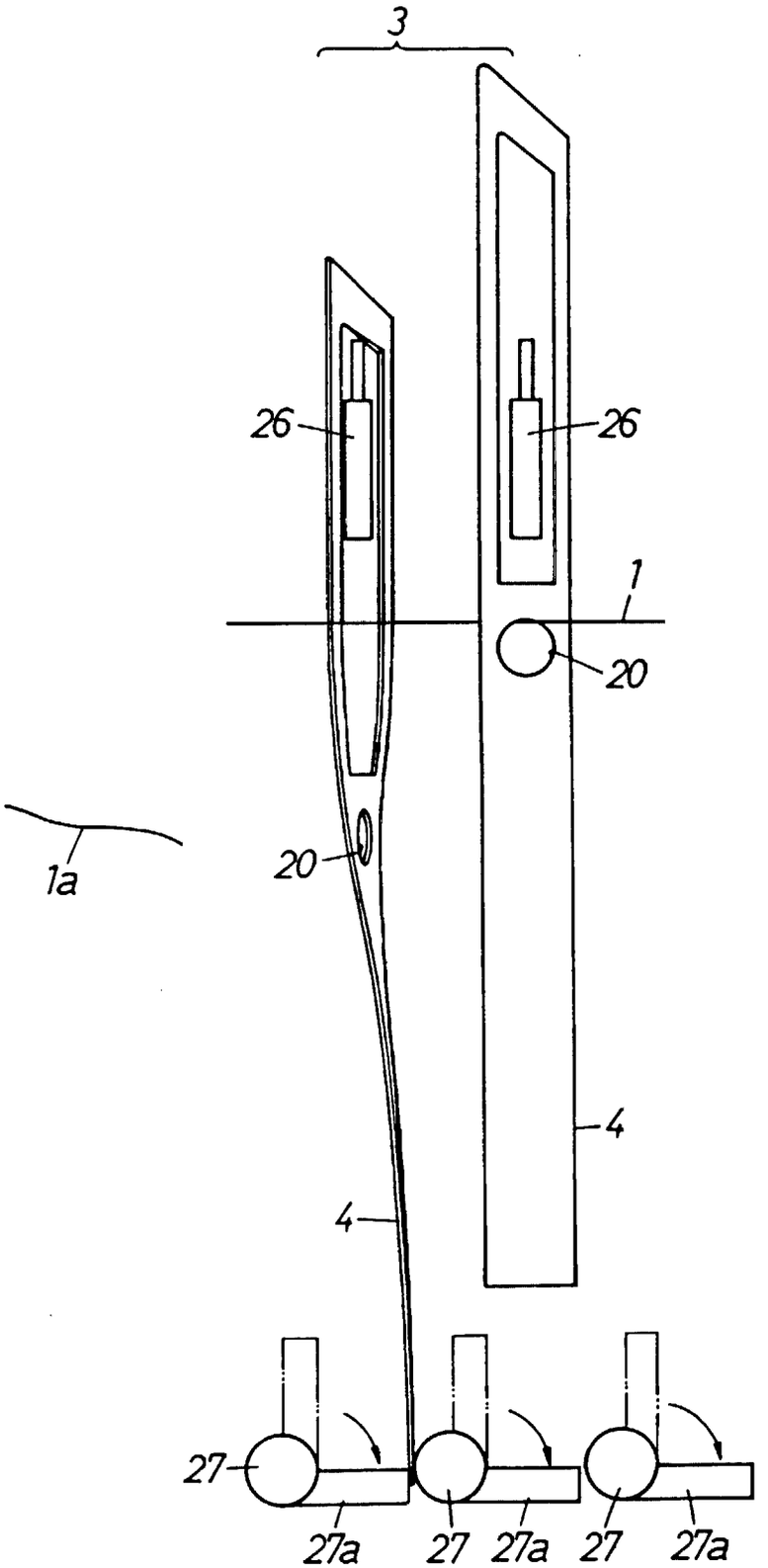

FIG.5

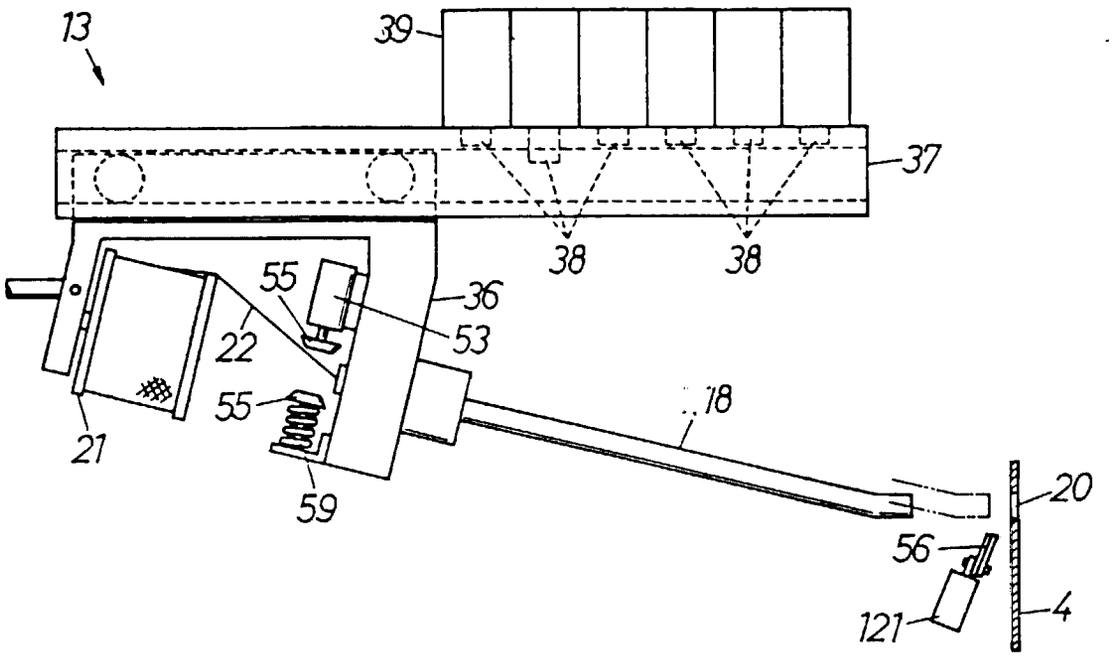

FIG.6

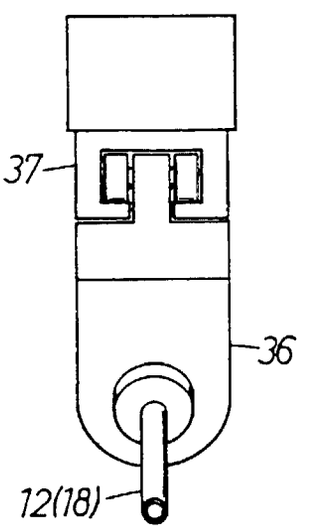

FIG.7